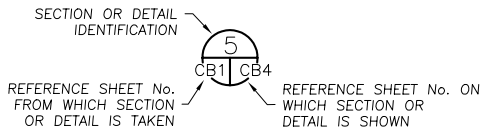
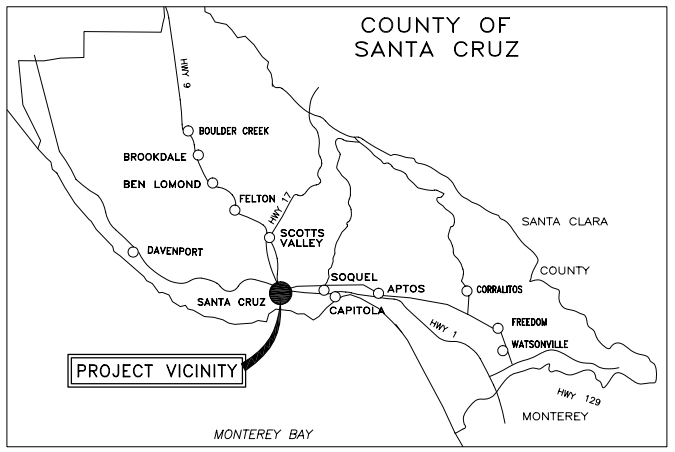
SHEET INDEX

SECTION AND DETAIL CONVENTION



STATE MAP

N.T.S.



COUNTY MAP

N.T.S.

LEGEND

N	NEW
EL	ELEVATION
C.Y.	CUBIC YARD
E	EXISTING
GALV.	GALVANIZED
TYP.	TYPICAL
STA	STATION
CMP	CORRUGATED METAL PIPE
WSL	WATER SURFACE ELEVATION
LF	LINEAR FEET
CONST.	CONTRUCT
CMP	CORRUGATED METAL PIPE

VALENCIA CREEK

FISH LADDER REPLACEMENT

LOCATED AT

APTOS
COUNTY OF SANTA CRUZ

PREPARED AT THE REQUEST OF THE

NATURAL RESOURCE EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD

VICINITY MAP

N.T.S.

GENERAL NOTES

1) PLANS PREPARED AT THE REQUEST OF:
NATURAL RESOURCE EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD
OF SANTA CRUZ COUNTY INC.
501 SOQUEL AVENUE, SUITE E
SANTA CRUZ, CA 95062
(831) 457–1741

2) BASIS OF BEARINGS: ASSUMED WITH N76°20'22"E BETWEEN CONTROL POINTS #679 AND #676 AS SHOWN ON C1.

3) ELEVATION DATUM: ASSUMED ELEVATION OF 96.89' AT CHISELED "X" IN CONCRETE, AS SHOWN ON SHT. C1.

4) FIELD WORK WAS PERFORMED BY SH&G ENGINEERING IN JANUARY, 2002.

5) REFER TO GEOTECHNICAL REPORT TO BE PREPARED BY:
SIGMA PRIME GEOSCIENCES, INC.
625–D PURISSIMA STREET
HALF MOON BAY, CA 94019
(650)726 7198

6) THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CLIENT TO DETERMINE BOUNDARY LOCATIONS AND TO OBTAIN ALL NECESSARY EASEMENTS AND PERMISSIONS FOR PERMITTING, CONSTRUCTION AND MAINTENANCE PURPOSES.

7) CONTRACTOR SHALL SUBMIT CONSTRUCTION ACCESS, STAGING, AND PHASING PLAN TO BE APPROVED BY THE ENGINEER BEFORE COMMENCING WORK.

8) CONTRACTOR SHALL INDEPENDENTLY VERIFY MATERIAL AND GRADING QUANTITIES FOR CONSTRUCTION BID TO THE OWNER.

9) THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER (831)–427–0288, 24 HOURS PRIOR TO START OF CONSTRUCTION.

10) EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES. CONTRACTOR SHALL DISCOVER OR VERIFY LOCATION OF AFFECTED UTILITY LINES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE, PRIOR TO COMMENCING ANY GRADING ACTIVITIES. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS, AND SHALL BE SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. CONTRACTOR TO CALL UNDERGROUND SERVICE ALERT (1–800–642–2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

11) CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

12) SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, HE SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

13) ALL CONSTRUCTION SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS IN THE CURRENT EDITION OF THE COUNTY OF SANTA CRUZ DESIGN CRITERIA.

14) THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

15) ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL FENCE AND/OR BARRICADE THE CONSTRUCTION AREA AS REQUIRED TO PROTECT ADJACENT SITES, VEHICULAR TRAFFIC AND PEDESTRIAN TRAFFIC. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA, IN THE CONSTRUCTION PRACTICES OF ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

16) THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

17) ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH ENGINEER AND THE OWNER'S DESIGNATED REPRESENTATIVE SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL.

18) THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. ALL MATERIALS SHALL BE STORED WITHIN APPROVED CONSTRUCTION AREAS.

19) THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, IN ACCORDANCE WITH LOCAL ORDINANCES, THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS.

20) THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, AT HIS EXPENSE, ALL PERMITS REQUIRED BY LOCAL AGENCIES AND NOT PREVIOUSLY OBTAINED BY THE OWNER. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

21) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT.

Rev	Date	Description	By
		DRAFT	

SH&G
115 Limekiln Street, Santa Cruz, CA 95060
weld@swansonhlzo.com (831)-427-0288
A division of Swanson Hydrology & Geomorphology, a California Corporation

REGISTERED PROFESSIONAL ENGINEER
WILLIAM T. WELD
No. 62235
Exp. 9-30-01
CIVIL
STATE OF CALIFORNIA

NATURAL RESOURCE EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD

COVER SHEET

VALENCIA CREEK
FISH LADDER REPLACEMENT
APTOS
COUNTY OF SANTA CRUZ
CA

Date 06/02
Scale AS SHOWN
Project 02–289

CO | 1 OF 6

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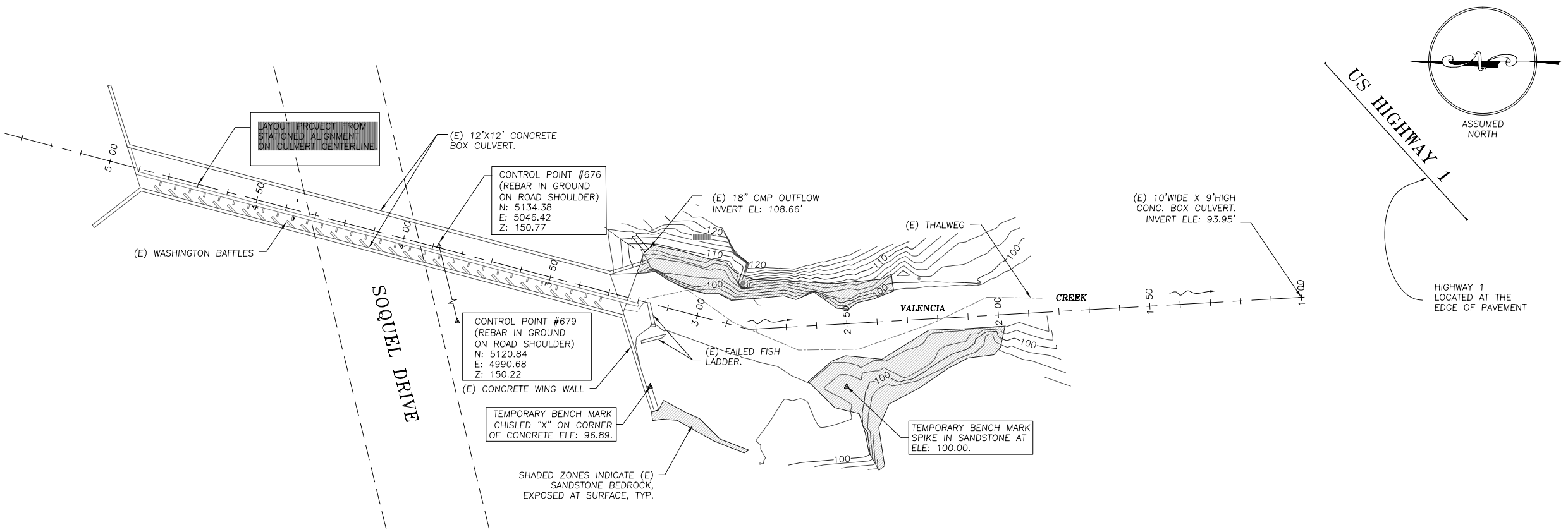
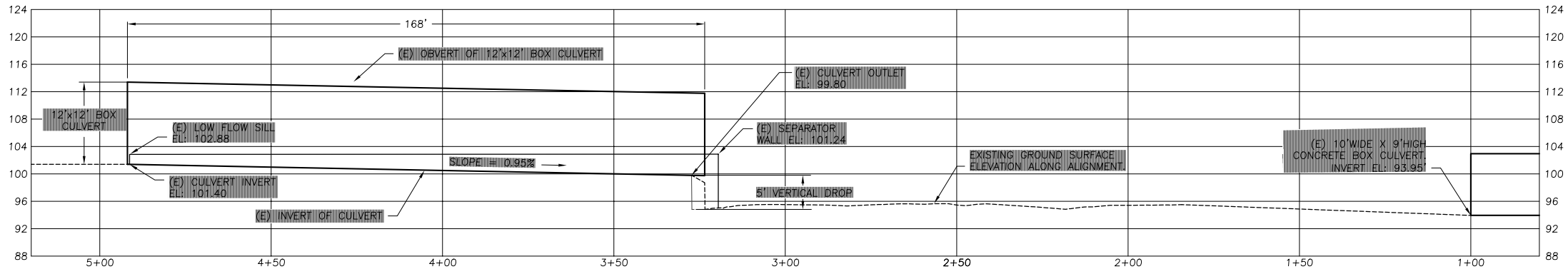


SITE OVERVIEW
SCALE: 1"=20'



LONGITUDINAL PROFILE
SCALE: H:1"=20', V:1"=10'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

Rev	Date	Description	By
		DRAFT	

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A division of Swanson Hydrology & Geomorphology, a California Corporation

REGISTERED PROFESSIONAL ENGINEER TIMOTHY T. WELD No. 62235 Exp. 9-30-01 CIVIL STATE OF CALIFORNIA

NATURAL RESOURCE EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD

EXISTING CONDITIONS

SITE OVERVIEW AND PROFILE

VALENCIA CREEK
FISH LADDER REPLACEMENT
APTOS
COUNTY OF SANTA CRUZ
CA

Date 06/02
Scale AS SHOWN
Project 02-289

C1

2 OF 6

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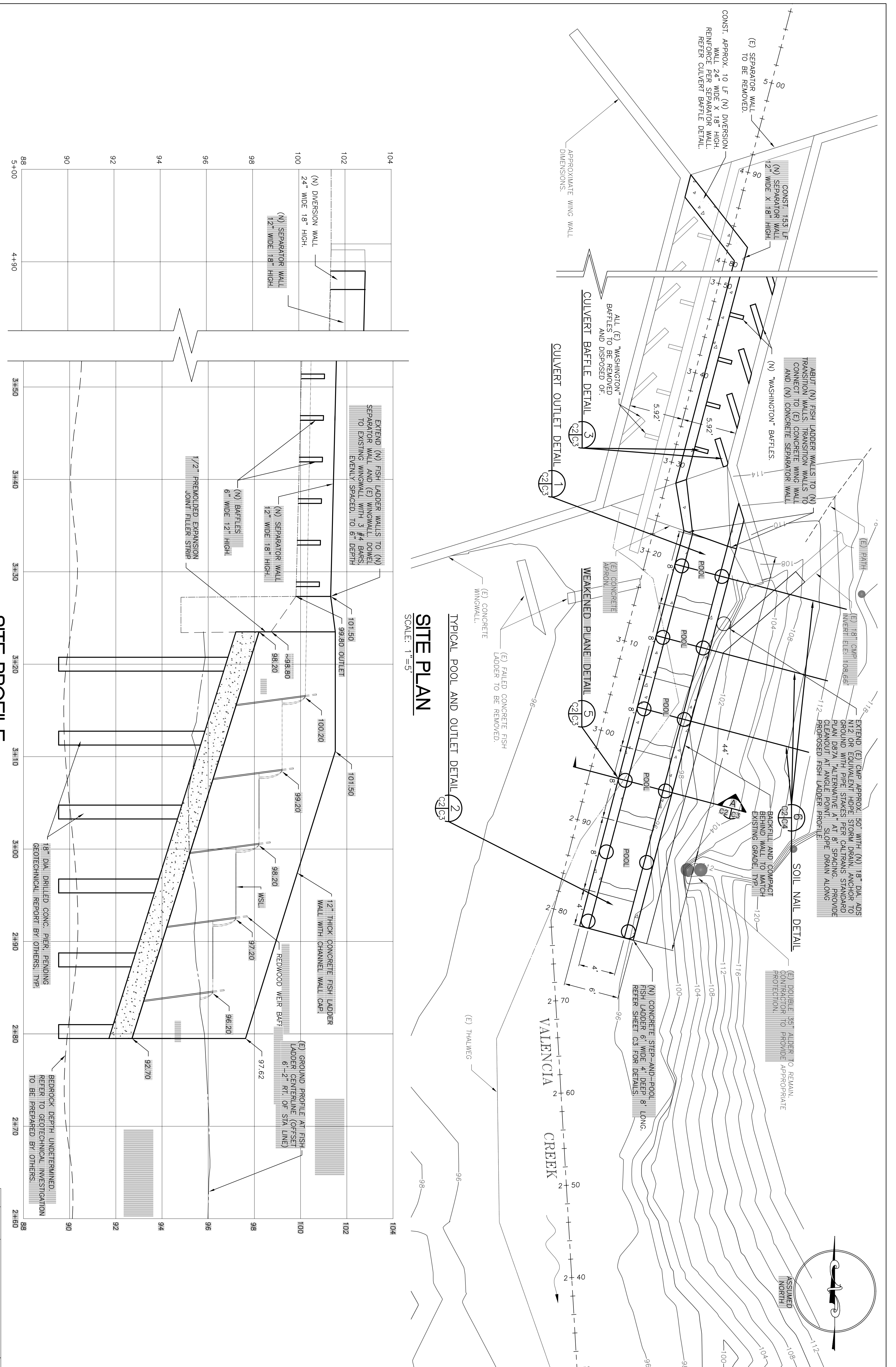
SITE PLAN
SCALE: 1"=5'
SITE PROFILE
SCALE: H: 1"=5', V: 1"=2'
(E) SEPARATOR WALL TO BE REMOVED.
CONST. APPROX. 10 LF (N) DIVERSION WALL 24" WIDE X 18" HIGH. REINFORCE PER SEPARATOR WALL. REFER CULVERT BAFFLE DETAIL.
APPROXIMATE WING WALL DIMENSIONS.
CONST. 153 LF (N) SEPARATOR WALL 12" WIDE X 18" HIGH.
(N) "WASHINGTON" BAFFLES.
ABUT (N) FISH LADDER WALLS TO (N) TRANSITION WALLS. TRANSITION WALLS TO CONNECT TO (E) CONCRETE WING WALL AND (N) CONCRETE SEPARATOR WALL.
ALL (E) "WASHINGTON" BAFFLES TO BE REMOVED AND DISPOSED OF.
CULVERT BAFFLE DETAIL
CULVERT OUTLET DETAIL
WEAKENED PLANE DETAIL
TYPICAL POOL AND OUTLET DETAIL
SOIL NAIL DETAIL
(E) PATH
(E) 18" CMP INVERT ELE: 108.66'
EXTEND (E) CMP APPROX. 50' WITH (N) 18" DIA. ADS N12 OR EQUIVALENT HDPE STORM DRAIN. ANCHOR TO GROUND WITH PIPE STAKES PER CALTRANS STANDARD PLAN D87A "ALTERNATIVE A" AT 8' SPACING. PROVIDE CLEANOUT AT ANGLE POINT. SLOPE DRAIN ALONG PROPOSED FISH LADDER PROFILE.
(E) CONCRETE APRON.
(E) CONCRETE WINGWALL.
(E) FAILED CONCRETE FISH LADDER TO BE REMOVED.
BACKFILL AND COMPACT BEHIND WALL TO MATCH EXISTING GRADE, TYP.
(E) DOUBLE 35" ALDER TO REMAIN. CONTRACTOR TO PROVIDE APPROPRIATE PROTECTION.
(N) CONCRETE STEP-AND-POOL FISH LADDER 6' WIDE 4' DEEP 8' LONG. REFER SHEET C3 FOR DETAILS.
(E) THALWEG
VALENCIA CREEK
POOL
5.92'
44'
ASSUMED NORTH
(N) DIVERSION WALL 24" WIDE 18" HIGH.
(N) SEPARATOR WALL 12" WIDE 18" HIGH.
EXTEND (N) FISH LADDER WALLS TO (N) SEPARATOR WALL AND (E) WINGWALL. DOWEL TO EXISTING WINGWALL WITH 3 #4 BARS, EVENLY SPACED, TO 6" DEPTH
(N) BAFFLES 6" WIDE 12" HIGH.
1/2" PREMOLDED EXPANSION JOINT FILLER STRIP
101.50
99.80 OUTLET
~98.80
98.20
100.20
99.20
97.20
96.20
92.70
97.62
WSL
12" THICK CONCRETE FISH LADDER WALL WITH CHANNEL WALL CAP.
REDWOOD WEIR BAFFLE
(E) GROUND PROFILE AT FISH LADDER CENTERLINE (OFFSET 6'-2" RT. OF STA LINE)
18" DIA. DRILLED CONC. PIER, PENDING GEOTECHNICAL REPORT BY OTHERS, TYP.
BEDROCK DEPTH UNDETERMINED. REFER TO GEOTECHNICAL INVESTIGATION TO BE PREPARED BY OTHERS.
GRAPHIC SCALE
(IN FEET)
1 inch = 5 ft.

Rev	Date	Description	By

DRAFT

C2 3 OF 6	Date 06/02 Scale AS SHOWN Project 02-289	VALENCIA CREEK FISH LADDER REPLACEMENT APTOS COUNTY OF SANTA CRUZ CA	PROPOSED CONDITIONS SITE PLAN AND PROFILE	NATURAL RESOURCE EMPLOYMENT PROGRAM COMMUNITY ACTION BOARD	REGISTERED PROFESSIONAL ENGINEER MATT W. WELD No. 62235 Exp. 9-30-01 CIVIL STATE OF CALIFORNIA

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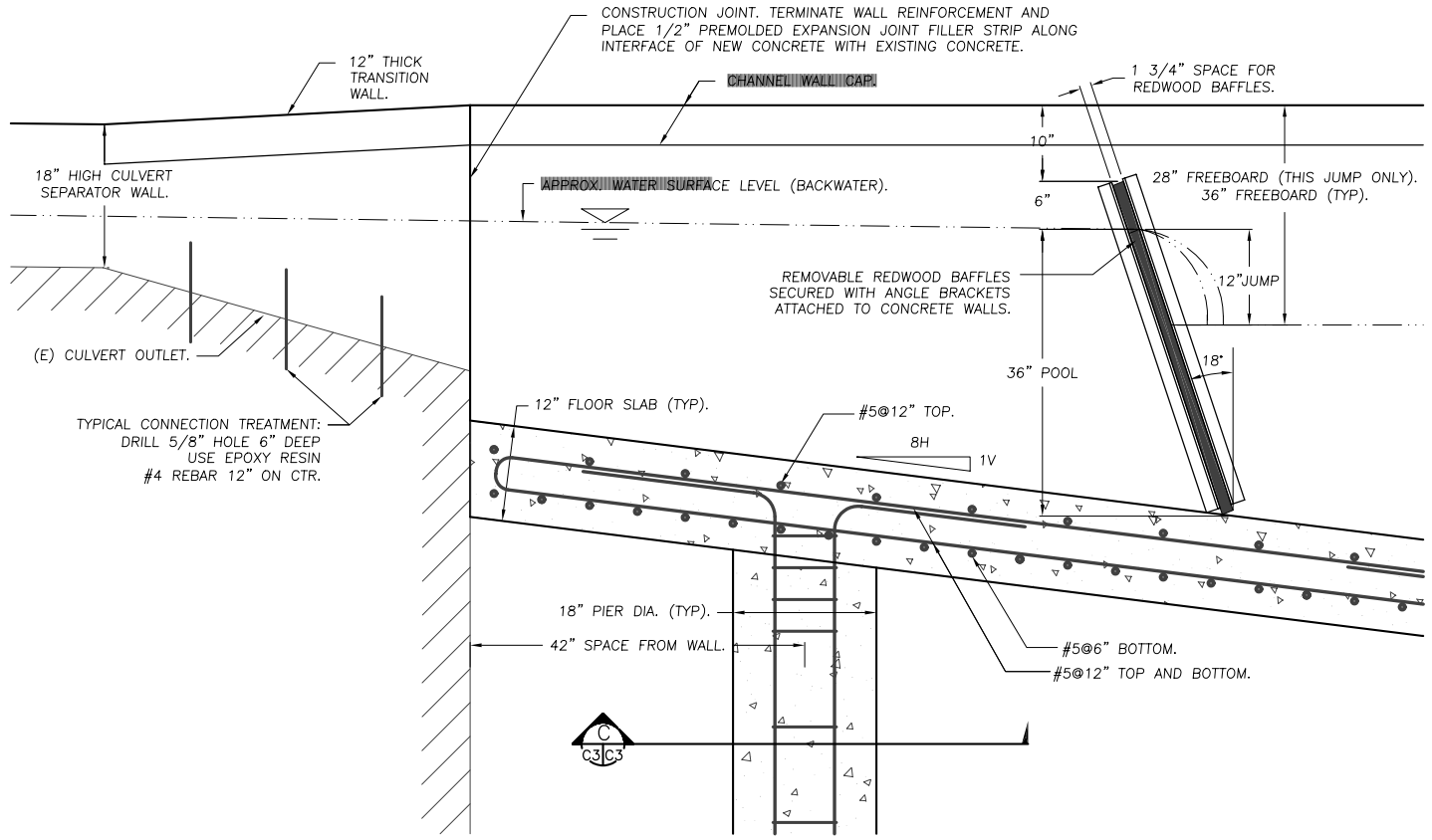
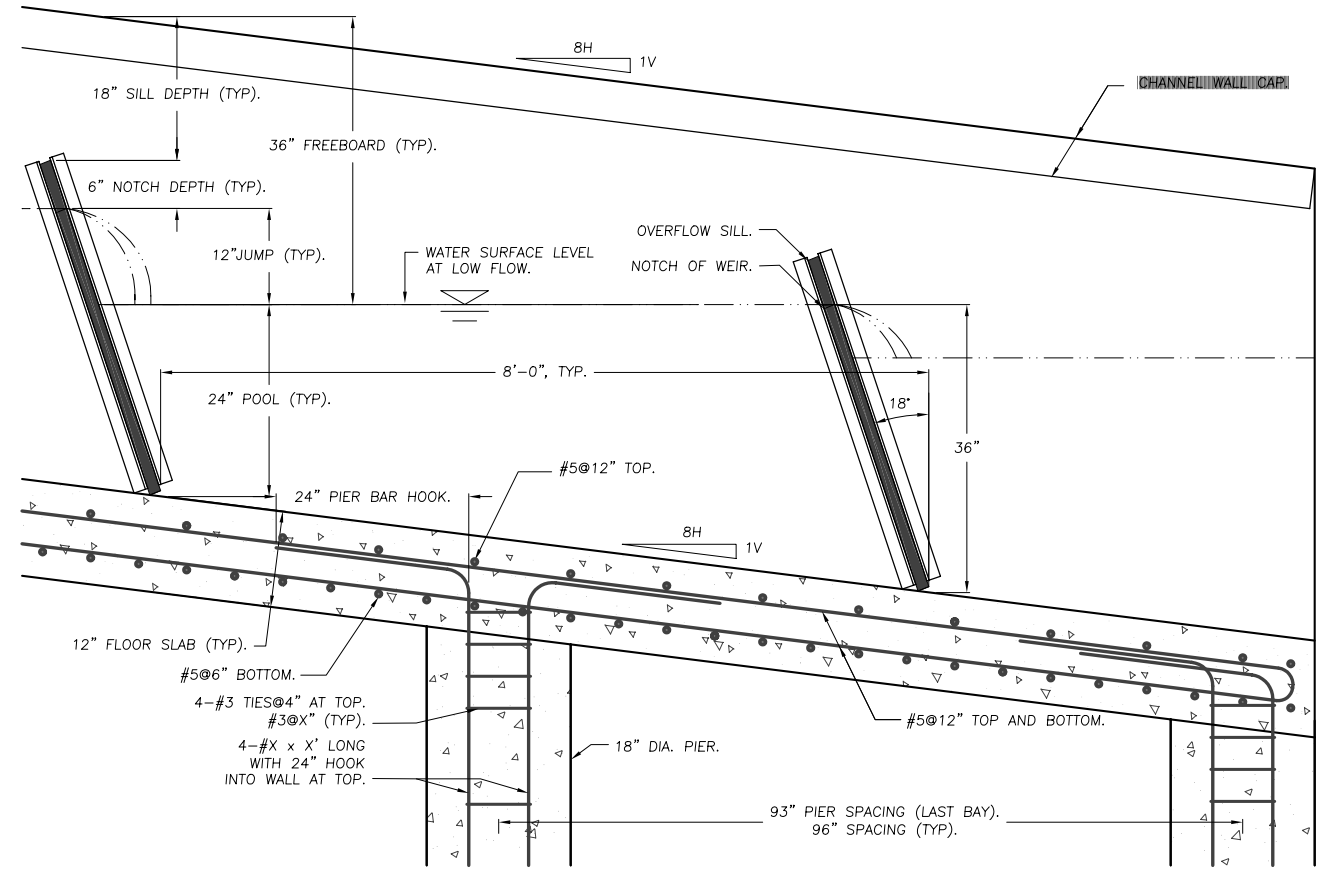
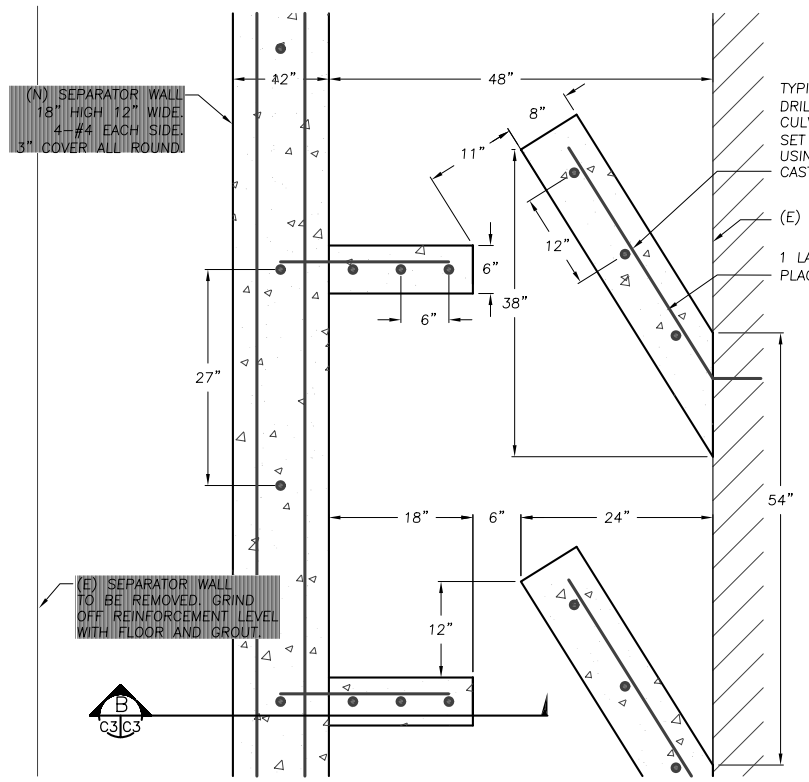


CULVERT OUTLET DETAIL 1
SCALE: 1"=1'
C2 C3

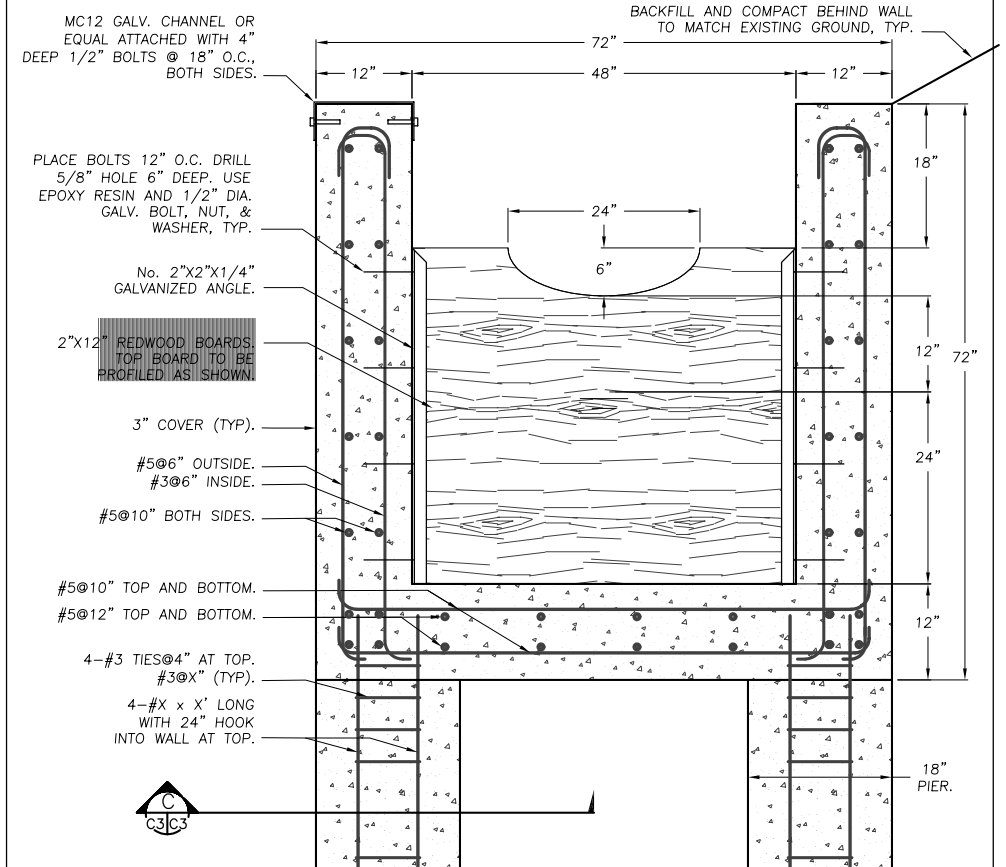


TYPICAL POOL AND OUTLET DETAIL 2
SCALE: 1"=1'
C2 C3

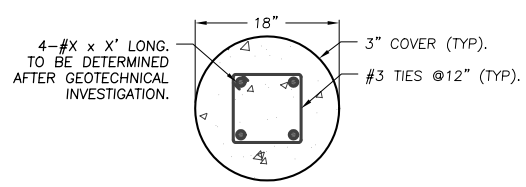


CULVERT BAFFLE DETAIL 3
SCALE: 1"=1'
C2 C3

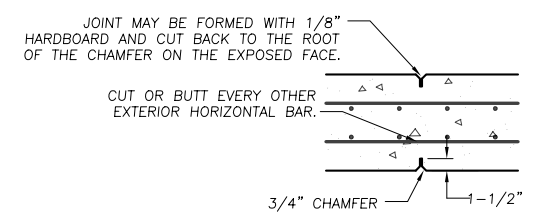
GRAPHIC SCALE
1 0 0.5 1 2 4
(IN FEET)
1 inch = 1 ft.



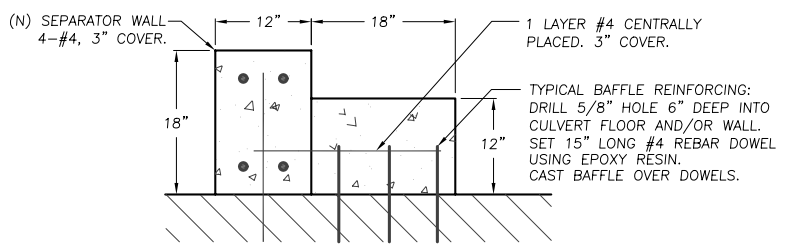
TYPICAL POOL SECTION A
SCALE: 1"=1'
C2 C3



PIER SECTION C
SCALE: 1"=1'
C3 C3



WEAKENED PLANE DETAIL 5
SCALE: 1"=1'
C2 C3



SEPARATOR WALL SECTION B
SCALE: 1"=1'
C3 C3

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REGISTERED PROFESSIONAL ENGINEER
WILLIAM T. WELD
No. 62235
Exp. 9-30-01
CIVIL
STATE OF CALIFORNIA

NATURAL RESOURCE EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD

PROPOSED FISH LADDER
DETAILS SHEET 1

VALENCIA CREEK
FISH LADDER REPLACEMENT
APTOS
COUNTY OF SANTA CRUZ
CA

Date 06/02
Scale AS SHOWN
Project 02-289

C3

4 OF 6

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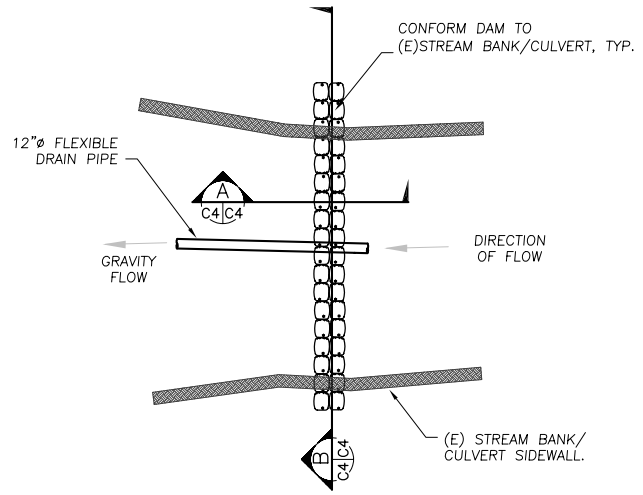
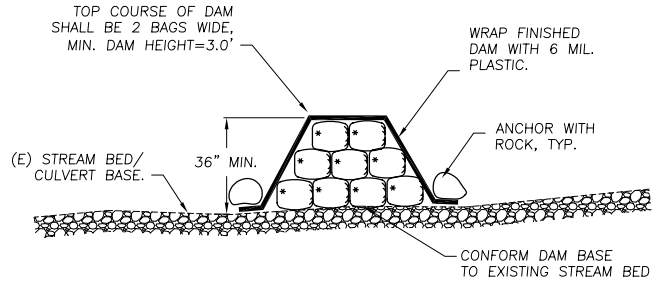
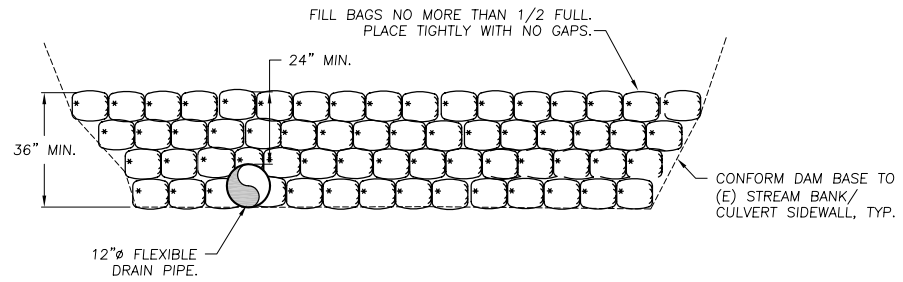


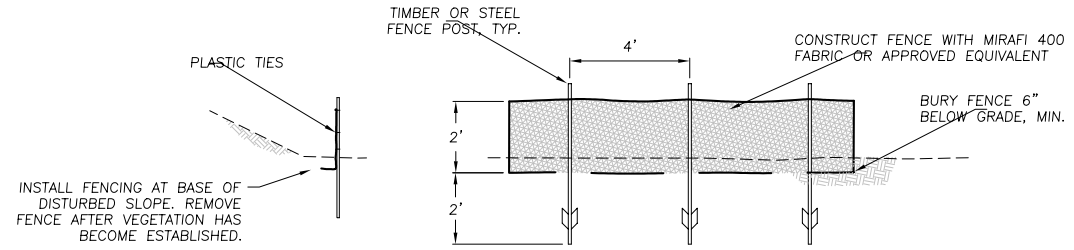
TYPICAL DAM PLAN 8 (C5 | C4)
N.T.S.



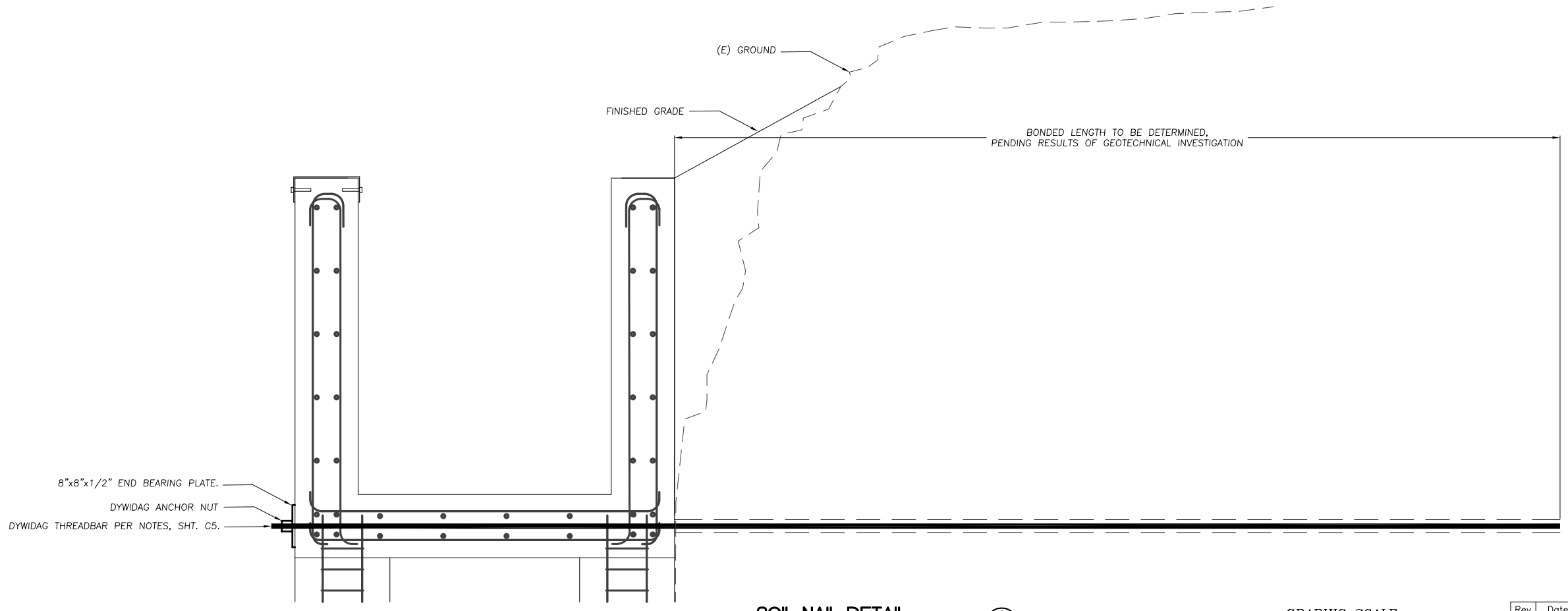
TYPICAL DAM PROFILE A (C5 | C4)
N.T.S.



TYPICAL DAM SECTION B (C4 | C4)
N.T.S.



SILT FENCE 7 (C5 | C4)
N.T.S.



SOIL NAIL DETAIL 6 (C2 | C4)
SCALE: 1"=1'

GRAPHIC SCALE
1 0 0.5 1 2 4
(IN FEET)
1 inch = 1 ft.

Rev	Date	Description	By
		DRAFT	

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115 Limekiln Street, Santa Cruz, CA 95060
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A division of Swanson Hydrology & Geomorphology, a California Corporation

PROFESSIONAL ENGINEER * WILLIAM T. WELD * No. 62235 Exp. 9-30-01 * CIVIL * STATE OF CALIFORNIA * 1936 ESTABLISHED

NATURAL RESOURCE
EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD

PROPOSED
FISH LADDER
DETAILS SHEET 2

VALENCIA CREEK
FISH LADDER REPLACEMENT
APTOS
COUNTY OF SANTA CRUZ
CA

Date 06/02
Scale AS SHOWN
Project 02-289

C4 | 5 OF 6

R:\LAND PROJECTS\02-289_VALENCIA-CRK\dwg\02-289-100%.dwg 03/14/2002 05:06:14 PM PST

CONCRETE

1. ALL CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 3,000 P.S.I. AT 28 DAYS. ALL CONCRETE SHALL BE REGULAR WEIGHT (UNLESS SPECIFICALLY NOTED OTHERWISE).
2. ALL CONCRETE WORK SHALL COMPLY WITH U.B.C. CHAPTER 19.
3. SPECIAL INSPECTION (AS REQUIRED OR SPECIFIED) SHALL CONFORM TO U.B.C. CHAPTER 17. SPECIAL INSPECTION SERVICES SHALL BE PROVIDED BY AN I.C.B.O. CERTIFIED DEPUTY INSPECTOR OR BUILDING DEPARTMENT APPROVED ENGINEER.
4. CEMENT SHALL BE PORTLAND CEMENT TYPE II AND SHALL CONFORM TO U.B.C. STANDARD NO. 19–1.
5. AGGREGATES SHALL BE 3/4" MAXIMUM SIZE, CLEAN, DURABLE GRANITE AND FREE FROM DELETERIOUS MATERIAL.
6. WHERE NOT SPECIFICALLY DETAILED, THE MINIMUM CONCRETE COVER ON REINFORCING STEEL SHALL BE:
   A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH OR WEATHER: 3"
   B. CONCRETE PLACED AGAINST FORMS, BUT EXPOSED TO EARTH OR WEATHER: 3"
   C. SLABS, WALL & JOISTS, NOT EXPOSED TO EARTH OR WEATHER 3"
   D. BEAMS, GIRDERS & COLUMNS, NOT EXPOSED TO EARTH OR WEATHER: 3"
7. REINFORCING BARS LARGER THAN #8 ARE NOT PERMITTED UNLESS SPECIFICALLY DETAILED OR NOTED OTHERWISE.
8. MINIMUM LAP FOR ALL REINFORCING BARS AT SPLICES: (SPLICES TO BE STAGGERED)

   #3, #4, #5 & #6_____24"
   #7_____28"
   #8_____32"

9. THE MINIMUM RADIUS OF BEND FOR REINFORCING STEEL (MEASURED ON THE INSIDE OF BAR) SHALL BE AS FOLLOWS:

   #3_____1 1/8" #6_____2 1/4"
   #4_____1 1/2" #7_____2 5/8"
   #5_____1 7/8" #8_____3"

10. ALL ANCHOR BOLTS USED IN CONCRETE CONSTRUCTION SHALL HAVE A MINIMUM TOTAL EMBEDMENT AS FOLLOWS, U.N.O.

    5/8" DIA OR SMALLER_____7"
    3/4" DIA_____8"
    7/8" DIA_____9"
    1 DIA"_____10"

11. LOCATION OF ALL CONSTRUCTION JOINTS, OTHER THAN SPECIFIED, SHALL BE APPROVED BY ENGINEER PRIOR TO PLACING. CONSTRUCTION JOINTS SHALL BE THOROUGHLY AIR AND WATER CLEANED AND HEAVILY ROUGHENED SO AS TO EXPOSE COARSE AGGREGATES. ALL SURFACES TO RECEIVE CONCRETE SHALL BE MAINTAINED CONTINUOUSLY WET AT LEAST THREE HOURS IN ADVANCE OF PLACING.
12. ALL REINFORCING STEEL, ANCHOR BOLTS, DOWELS, INSERTS AND ANY OTHER HARDWARE TO BE SET IN CONCRETE SHALL BE WELL SECURED IN POSITION PRIOR TO PLACING OF CONCRETE.
13. ENGINEER SHALL BE NOTIFIED FOR REINFORCEMENT INSPECTION 24 HOURS PRIOR TO PLACING ANY CONCRETE.
14. CONTRACTOR SHALL OBTAIN APPROVAL FROM ENGINEER PRIOR TO PLACING SLEEVES, PIPES, DUCTS, CHASES, CORING AND OPENINGS ON OR THROUGH STRUCTURAL CONCRETE BEAMS, WALLS, FLOORS AND ROOF SLABS, UNLESS SPECIFICALLY DETAILED OR NOTED. ALL PIPES OR CONDUITS PASSING THROUGH CONCRETE MEMBERS SHALL BE SLEEVED WITH STANDARD STEEL PIPES.
15. FORM WORK DESIGN AND REMOVAL SHALL CONFORM TO U.B.C. SECTION 1906.
16. VIBRATE ALL CONCRETE (INCLUDING SLABS ON GRADE) AS IT IS PLACED, WITH A MECHANICAL VIBRATOR OPERATED BY EXPERIENCED PERSONNEL. THE VIBRATOR SHALL BE USED TO CONSOLIDATE THE CONCRETE, NOT TRANSPORT IT. REINFORCING AND FORMS SHALL NOT BE VIBRATED.
17. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE A.C.I. BUILDING CODE (A.C.I. 318–95), THE LATEST EDITIONS OF THE A.C.I. MANUALS OF CONCRETE PRACTICE, A.C.I. SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (A.C.I. 301–96)
18. FORM REMOVAL: REMOVE FORMS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
    ALL FORMS TO REMAIN IN PLACE FOR 15 DAYS FOLLOWING PLACEMENT OF CONCRETE MIX.
19. CONCRETE SHALL NOT FREE FALL MORE THAN FIVE FEET. USE TREMIE, WATER PLACEMENT, PUMP OR OTHER APPROVED METHODS.
20. CONCRETE SHALL BE MAINTAINED IN A MOIST CONDITION FOR A MINIMUM OF 5 DAYS AFTER PLACEMENT.
21. MIX DESIGNS SHALL BE PREPARED BY AN APPROVED TESTING LABORATORY AND SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
22. ONLY ONE GRADE OF CONCRETE SHALL BE ALLOWED ON PROJECT SITE AT ANY ONE TIME.
23. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER, TYPICAL.
24. CONTRACTOR SHALL FORWARD CONCRETE MIX DOCUMENTS TO PROJECT ENGINEER FOR REVIEW.

REINFORCING STEEL

1. ALL REINFORCING STEEL SHALL BE DEFORMED INTERMEDIATE GRADE BARS CONFORMING TO THE FOLLOWING:

   NO. 4 BARS AND SMALLER.....ASTM A615, GRADE 40
   NO. 5 BARS AND LARGER.....ASTM A615, GRADE 60
   REINFORCING STEEL TO BE WELDED.....ASTM A760, GRADE 40

2. TO HOLD REINFORCING BARS IN THEIR TRUE POSITION AND PREVENT DISPLACEMENT, STANDARD TIE AND ANCHORAGE DEVICES MUST BE PROVIDED. PLACING OF REINFORCEMENT SHALL CONFORM TO UBC SECTION 1907.5.
3. SHOP DRAWINGS FOR FABRICATION OF ANY REINFORCING STEEL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO BEGINNING ANY FABRICATION.
4. REFER TO CONCRETE AND CONCRETE BLOCK NOTES FOR MINIMUM SPLICE LENGTH AND MINIMUM RADIUS OF BEND, OF REINFORCING.
5. SPLICING OF BARS SHALL HAVE MINIMUM LAP PER DETAIL C/3 IN ALL CASES, UNLESS DIMENSIONED OTHERWISE ON DETAILS. WIRE BARS TOGETHER AT LAPS AND SPLICES. STAGGER SPLICES IN ADJACENT HORIZONTAL AND SLOPING REINFORCING BARS A MINIMUM OF THE REQUIRED SPLICE LENGTH.
6. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.
7. FABRICATION, ERECTION AND PLACEMENT OF REINFORCING STEEL SHALL CONFORM TO CONCRETE REINFORCING STEEL INSTITUTE OF STANDARD PRACTICE.
8. REINFORCING STEEL SHALL BE CLEAN OF RUST, GREASE OR OTHER MATERIAL LIKELY TO IMPAIR BOND.
9. SPACING OF BARS SHALL BE CONSIDERED AS MAXIMUM SPACING.

FOUNDATIONS:

1. FOUNDATION SOIL STRATA IS NATIVE SOIL AS PER THE PRELIMINARY GEOTECHNICAL INVESTIGATION TO BE PREPARED.
2. THE ELEVATIONS OF BOTTOMS OF FOUNDATIONS AS SHOWN ON THESE DRAWINGS INDICATE THE ESTIMATED MINIMUM FOUNDATION DEPTHS.
3. CENTER FOOTINGS UNDER WALLS OR COLUMNS UNLESS OTHERWISE INDICATED ON THESE DRAWINGS.
4. GEOTECHNICAL REPORT SHALL BE A PART OF THE PLANS AND SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
5. CONTRACTOR SHALL SUBMIT WORK PLAN, DESCRIBING PEIR PLACEMENT METHODS, FOR ENGINEER'S APPROVAL, PRIOR TO COMMENCING WORK.

CONCRETE MIX: (SEE ALSO "CONCRETE" SECTION)

1. CONTRACTOR TO SUBMIT MIX DESIGN, PREPARED BY AN APPROVED TESTING LABORATORY, FOR ENGINEER'S REVIEW AND APPROVAL.
2. ALL CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS
3. SLUMP LIMITS 3"–4".
4. COARSE TO FINE AGGREGATE RATIOS: 55% COARSE TO 45% FINE. COARSE RATIO MAY BE 25% PEA GRAVEL (3/8") AND 30% ROCK (3/4").

EROSION CONTROL NOTES

1) PRIOR TO COMMENCING WORK, ALL AREAS TO REMAIN UNDISTURBED SHALL BE ADEQUATELY PROTECTED WITH TEMPORARY FENCING.

2) CONTRACTOR SHALL UTILIZE ONLY THE APPROVED ACCESS ROUTES, AS SHOWN ON THE PLANS, FOR TRANSPORT OF MATERIALS, AND SHALL BE SUBJECT ALL CONDITIONS OF THE SUPPLEMENTAL GENERAL PROVISIONS.

3) BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.

4) THE CONTRACTOR SHALL INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE EROSION.

5) THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL IN ACCORDANCE WITH SECTION 10 OF THE CALTRANS STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS.

6) CONTRACTOR SHALL SUBMIT CONSTRUCTION PHASING PLAN TO BE APPROVED BY THE ENGINEER BEFORE COMMENCING WORK.

7) DURING CONSTRUCTION AND PRIOR TO FINAL, ALL BARE AREAS ARE TO BE SEEDED, FERTILIZED AND MULCHED OR PERMANENTLY LANDSCAPED FROM OCTOBER 15 THROUGH APRIL 15 AND AT FINAL.

SEEDING, FERTILIZING AND MULCHING ARE TO OCCUR AT THE FOLLOWING RATES:

SANTA CRUZ COUNTY EROSION CONTROL MIX .....1.5 LBS/1000 SQ. FT.
FERTILIZER (16–20–0) ..... 21 LBS/1000 SQ. FT.
STRAW MULCH OR EQUIVALENT SEED, FERTILIZER AND MULCH
..... 23 BALES/1000 SQ. FT.

8) ALL EXCAVATED MATERIAL SHALL BE REMOVED TO AN APPROVED DUMP SITE OR DISPOSED OF ON SITE IN A MANNER THAT WILL NOT CAUSE EROSION.

DIVERSION NOTES

1. DESCRIPTION

1.1 A WATER DIVERSION SYSTEM SHALL BE INSTALLED TO DEWATER THE PROJECT SITE TO FACILITATE IN STREAM CONSTRUCTION AND TO REDUCE THE POTENTIAL IMPACTS TO WATER QUALITY DOWNSTREAM OF THE PROJECT SITE.

1.2 THE PROPOSED DIVERSION STRUCTURE CONSISTS OF TWO SEALED SAND BAG DAMS, ONE LOCATED AT EACH END OF THE PROJECT REACH, AND A GRAVITY FLOW PIPELINE.

1.3 THE CONTRACTOR SHALL CONFIRM THAT A FAVORABLE LONG TERM WEATHER FORECAST (1 WEEK MIN.) IS OBSERVED PRIOR TO PLACEMENT OF DIVERSION STRUCTURE.

1.4 PRIOR TO PLACEMENT OF DIVERSION STRUCTURE, FISH SHALL BE REMOVED FROM THE PROJECT REACH, IN ACCORDANCE WITH SECTION 2.

2. FISH REMOVAL

2.1 FISH SHALL BE REMOVED FROM THE PROJECT SITE BY A QUALIFIED FISHERIES BIOLOGIST, LICENSED FOR SUCH ACTIVITIES BY THE NATIONAL MARINE FISHERIES SERVICE AND THE CALIFORNIA DEPARTMENT OF FISH AND GAME.

2.2 BLOCK NETS SHALL BE PROVIDED AND INSTALLED BY THE FISHERIES BIOLOGIST. BLOCK NETS SHALL BE MAINTAINED BY THE CONTRACTOR BOTH UPSTREAM AND DOWNSTREAM OF THE WORK AREA THROUGHOUT THE PERIOD OF CONSTRUCTION. BLOCK NETS SHALL BE REMOVED BY THE FISHERIES BIOLOGIST AFTER THE DIVERSION IS REMOVED AND THE IN–CHANNEL WORK AREA IS RE–WATERED.

3. DIVERSION DAM

3.1 THE CONTRACTOR SHALL INSTALL A TEMPORARY SEALED SANDBAG DAM TO CAPTURE AND DIVERT STREAM FLOW UPSTREAM OF THE PROJECT SITE.

3.2 THE CONTRACTOR SHALL MAINTAIN THE DIVERSION DAM DURING THE COURSE OF CONSTRUCTION WORK.

3.3 THE DIVERSION STRUCTURE SHALL BE CONSTRUCTED AS SHOWN ON PLAN 8, SHT. C4 OR AS DIRECTED BY THE ENGINEER IN THE FIELD.

3.4 IN THE EVENT OF A SIGNIFICANT STORM, THE CONTRACTOR SHALL BE PREPARED TO TAKE NECESSARY MEASURES TO INSURE SAFE PASSAGE OF STORM WATER FLOW THROUGH THE PROJECT AREA, WITHOUT DAMAGE TO EXISTING STRUCTURES, OR INTRODUCTION OF EXCESSIVE SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY EROSION CONTROL B.M.P.'S AS PER CALTRANS STORM WATER QUALITY GUIDELINES.

4. GRAVITY FLOW DIVERSION SYSTEM

4.1 THE CONTRACTOR SHALL INSTALL A GRAVITY FLOW PIPELINE TO CONVEY STREAM FLOW THROUGH THE PROJECT SITE DURING DURING CONSTRUCTION.

4.2 THE GRAVITY PIPELINE SHALL BE CAPABLE OF CONVEYING 900 GPM (2 CFS) UNDER GRAVITY FLOW CONDITIONS, AND SHALL BE A MINIMUM DIAMETER OF 12", WITH A MANNING'S ROUGHNESS NOT EXCEEDING .012.

5. DEWATERING OF CONSTRUCTION AREAS

5.1 THE CONTRACTOR SHALL INSTALL SILT FENCES, AS SHOWN, BEFORE EXCAVATION OPERATIONS TAKE PLACE. SILT FENCES SHALL BE LOCATED SO AS TO CONTAIN ALL DISTURBED AREAS.

5.2 ANY ADDITIONAL DEWATERING ACTIVITIES WHICH MAY BE REQUIRED FOR CONSTRUCTION PURPOSES SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT RESULT IN AN EXCEEDANCE OF ANY WATER QUALITY REQUIREMENTS ESTABLISHED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.

5.3 THE CONTRACTOR SHALL REMOVE THE DIVERSION AND TEMPORARY EROSION CONTROL WORKS AT THE COMPLETION OF CONSTRUCTION IN THE REVERSE ORDER OF INSTALLATION.

MAINTENANCE AND OPTIMIZATION OF LADDER

1. VALENCIA CREEK TRANSPORTS SIGNIFICANT AMOUNTS OF SEDIMENT AND WOODY DEBRIS. REGULAR MAINTENANCE OF THE EXISTING BAFFLED CULVERTS BENEATH SOQUEL DRIVE AND HIGHWAY 1 IS RECOMMENDED TO OPTIMIZE FISH PASSAGE.

2. SEDIMENT AND DEBRIS MUST BE REMOVED FROM THE NEW FISH LADDER BEFORE AND DURING THE FISH PASSAGE SEASON (FALL, WINTER AND SPRING). SEDIMENT MAY BE FLUSHED BY RAISING OF THE REDWOOD BAFFLES.

3. POST CONSTRUCTION MONITORING UNDER A RANGE OF FLOW CONDITIONS IS RECOMMENDED TO OPTIMIZE THE PERFORMANCE OF THE NEW FISH LADDER. THE INCORPORATION OF ADJUSTABLE BAFFLES WILL ALLOW FOR ADJUSTMENT OF POOL WATER SURFACE LEVELS.

SOIL NAIL NOTES

1. THE CONTRACTOR SHALL PROVIDE, INSTALL AND TEST SOIL NAILS AND ACCESSORIES. ALL SOIL NAILS SHALL BE TESTED, IMMEDIATELY FOLLOWING INSTALLATION. PENDING RESULTS OF THE TESTING, THE GEOTECHNICAL ENGINEER MAY REQUIRE ADDITIONAL TESTING.

2. ALL SOIL NAILS SHALL BE DYWIDAG #9 GRADE 75 THREADBAR SOIL NAIL ANCHORS, WITH "DOUBLE CORROSION PROTECTION", AS MANUFACTURED BY DYWIDAG SYSTEMS INTERNATIONAL USA, INC. DYWIDAG THREADBAR SHALL CONFORM TO ASTM A615. BEARING PLATE STEEL SHALL CONFORM TO ASTM A–36/A36M. DIMENSIONS SHALL BE AS SHOWN ON THE DRAWINGS. ADDITIONAL HOLES FOR GROUT TUBES, WHEN REQUIRED, SHALL BE PROVIDED IN THE PLATE. HEX NUT SHALL BE HEAVY DUTY, HEXAGONAL TYPE, CAPABLE OF DEVELOPING 100% OF THE GUARANTEED ULTIMATE TENSILE STRENGTH OF THE BARS

3. DRILLING, INSTALLATION, STRESSING, TESTING AND GROUTING OPERATIONS SHALL CONFORM TO THE MANUFACTURER'S RECOMMENDED SPECIFICATIONS FOR PERMANENT DYWIDAG THREADBAR SOIL NAIL ANCHORS. DYWIDAG PVC CENTRALIZERS SHALL BE INSTALLED AT FIVE FEET O.C., ALONG THE LENGTH OF THE SOIL NAIL, TO INSURE THAT THE SOIL NAIL WILL BE CENTERED IN THE HOLE, AND THAT MINIMUM GROUT COVER ENCAPSULATES THE BAR. DRILLING EQUIPMENT SHALL BE DESIGNED TO DRILL STRAIGHT AND OF SUFFICIENT DIAMETER TO PROVIDE 25mm GROUT COVER OVER THE BAR. HOLES SHALL BE CLEANED TO REMOVE LOOSE MATERIAL RESULTING FROM THE DRILLING OPERATIONS

4. SOIL NAILS SHALL BE GROUTED TO 40% OF FULL LENGTH, PRIOR TO TESTING. SOIL NAILS SHALL BE GROUTED TO FULL LENGTH, FOLLOWING TESTING. USE CEMENT GROUT WITH A WATER/CEMENT RATIO AS RECOMMENDED BY THE MANUFACTURER. FINE AGGREGATE CAN BE ADDED, BUT ONLY TO THE EXTENT THAT CEMENT CONTENT OF THE GROUT IS NOT LESS THAN 846 POUNDS PER CUBIC YARD OF GROUT. GROUT COMPRESSIVE STRENGTH SHOULD BE AT LEAST 1,500 PSI AT THE TIME OF TEST SOIL NAIL STRESSING.

5. PROOF TESTING: DURING TESTING, ALL SOIL NAILS SHALL BE PULLED UNTIL 1.33 TIMES THE SPECIFIED DESIGN LOAD IS ACHIEVED. STRESS SOIL NAIL INCREMENTALLY TO 5, 10, 15, 20 AND 27kips, RECORDING MOVEMENTS AT EACH INCREMENT. THE TOTAL LOAD MOVEMENT OF PULLING HEAD SHALL BE RECORDED TO THE NEAREST 0.001" (0.03mm). THE LOAD SHALL BE HELD AT EACH INCREMENT JUST LONG ENOUGH TO OBTAIN AN ACCURATE READING, BUT NOT LONGER THAN 1 MINUTE. THE TEST LOAD OF 27kips SHALL BE MAINTAINED FOR 10 MINUTES AND CUMULATIVE MOVEMENT READINGS SHALL THEN BE RECORDED AT 1, 2, 3, 4, 5, 6, AND 10 MINUTES. IF THE TOTAL CREEP MOVEMENT BETWEEN 1 AND 10 MINUTES EXCEEDS 0.04" (1mm), THE TEST LOAD SHALL BE MAINTAINED FOR AN ADDITIONAL 50 MINUTES AND THE MOVEMENT READINGS SHALL BE RECORDED AT 20, 30, 40, 50, AND 60 MINUTES. DURING THE LOAD PERIODS, THE HYDRAULIC PRESSURE SHALL NOT DEVIATE FROM THE TEST PRESSURE BY MORE THAN 50psi (0.35mpa) AND THE LOAD ALWAYS SHALL BE RETURNED TO THE TEST LOAD PRIOR TO TAKING THE MOVEMENT READING.

6. AFTER THE 10 MINUTE HOLD AT TEST LOAD, THE LOAD SHALL BE GRADUALLY RELEASED TO 0 kip.

7. DESIGN LOAD SHALL BE SPECIFIED ON THE PLANS, PENDING COMPLETION OF THE GEOTECHNICAL INVESTIGATION.

8. THE CONTRACTOR IS TO NOTIFY THE PROJECT GEOTECHNICAL ENGINEER FOUR DAYS PRIOR TO COMMENCEMENT OF DRILLING OPERATION.

STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO ASTM A36 UNLESS SHOWN OTHERWISE ON THE PLANS.
2. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION (EIGHTH EDITION).
3. PROVIDE SPECIAL INSPECTION AS PER UNIFORM BUILDING CODE.
4. ALL STEEL NOT EMBEDDED IN CONCRETE PIERS SHALL RECEIVE ONE COAT OF ZINC–RICH PRIMER AND ONE FINISH COAT OF COLD TAR EPOXY. TOUCH UP ALL ABRASIONS WITH FIELD COAT OF PRIMER.

Rev	Date	Description	By

DRAFT

SH&G
115 Linekiln Street, Santa Cruz, CA 95060
weld@swansonhlzo.com (831)-427-0288
A division of Swanson, Hydrology & Geomorphology, a California Corporation

PROFESSIONAL ENGINEER ★ WILLIAM T. WELD ★ No. 62235 Exp. 9–30–01 ★ REGISTERED ★ STATE OF CALIFORNIA ★ CIVIL

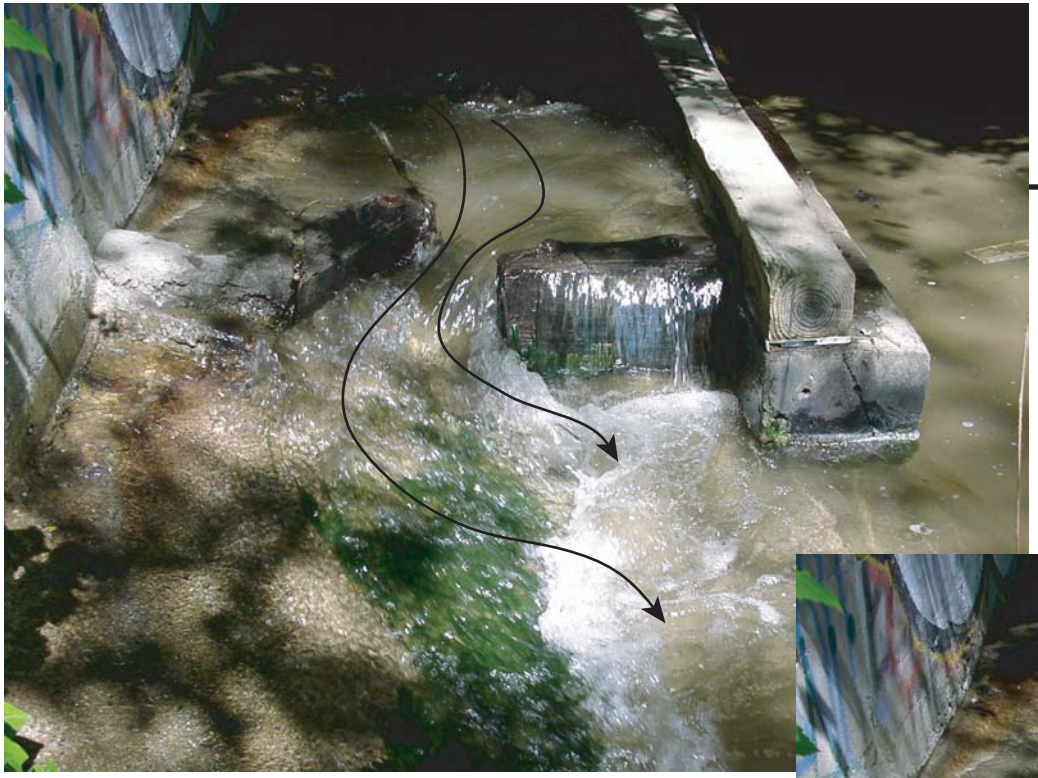
NATURAL RESOURCE EMPLOYMENT PROGRAM
COMMUNITY ACTION BOARD

PROPOSED FISH LADDER NOTES

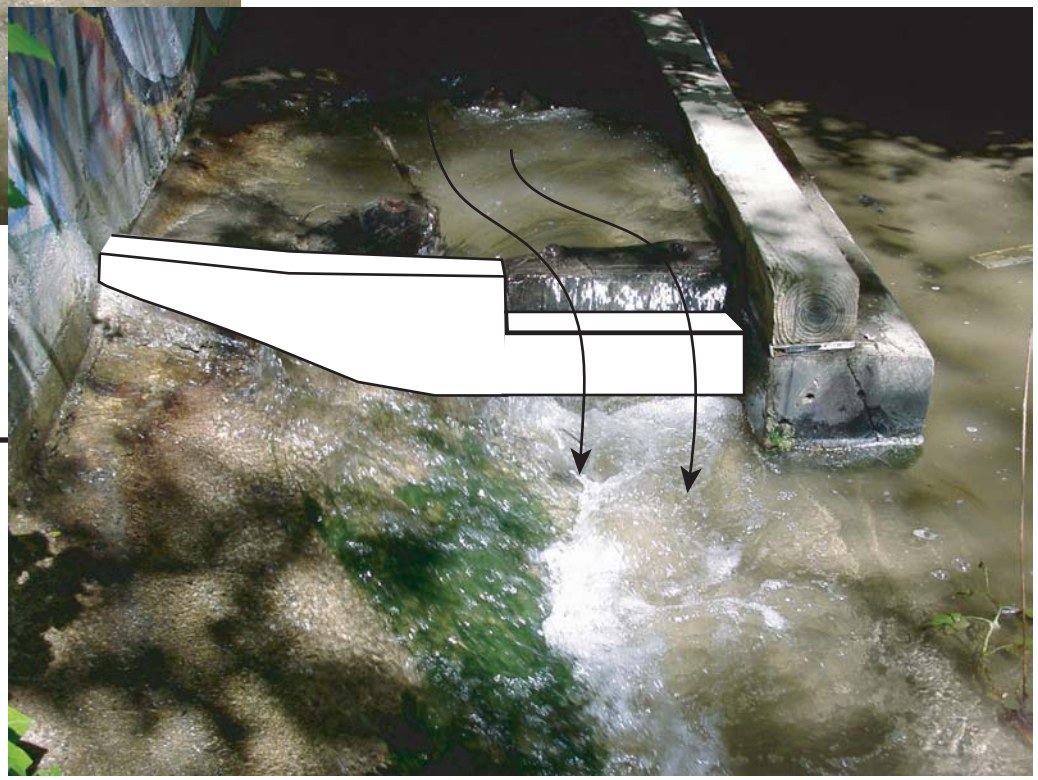
VALENCIA CREEK FISH LADDER REPLACEMENT APTOS COUNTY OF SANTA CRUZ CA

Date 06/02
Scale AS SHOWN
Project 02–289

C5 | 6 OF 6



Existing Conditions: The last wooden baffle of culvert 2 focuses water onto a slanted concrete surface away from the deeper pool below the baffle.



Proposed Weir: Replace the existing baffle with a new weir so that the notch is above the deeper water.

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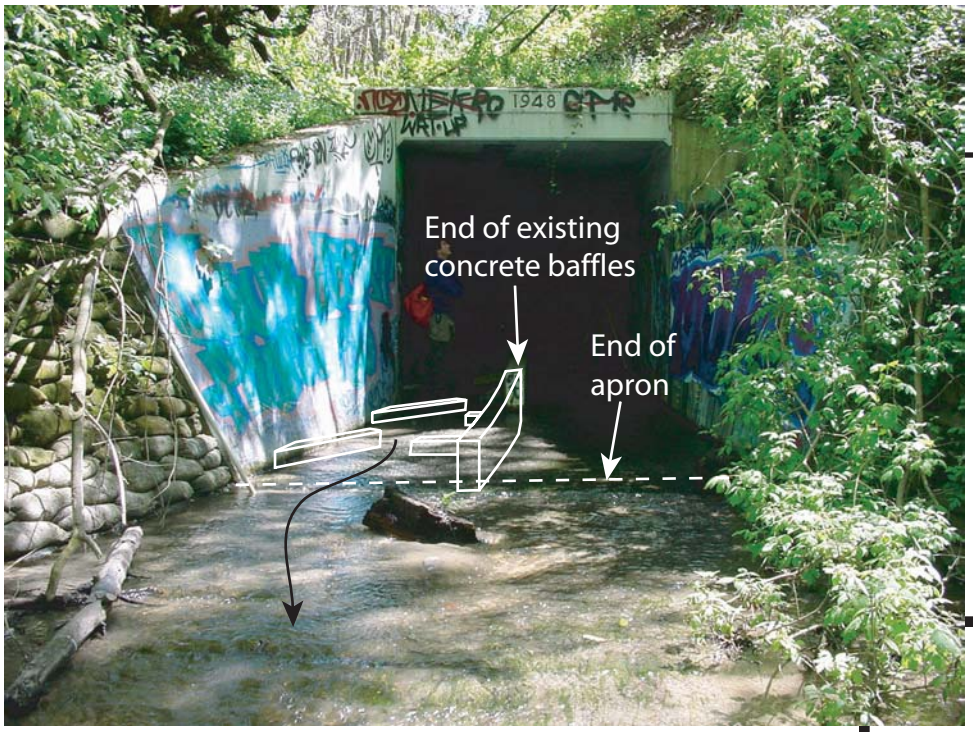
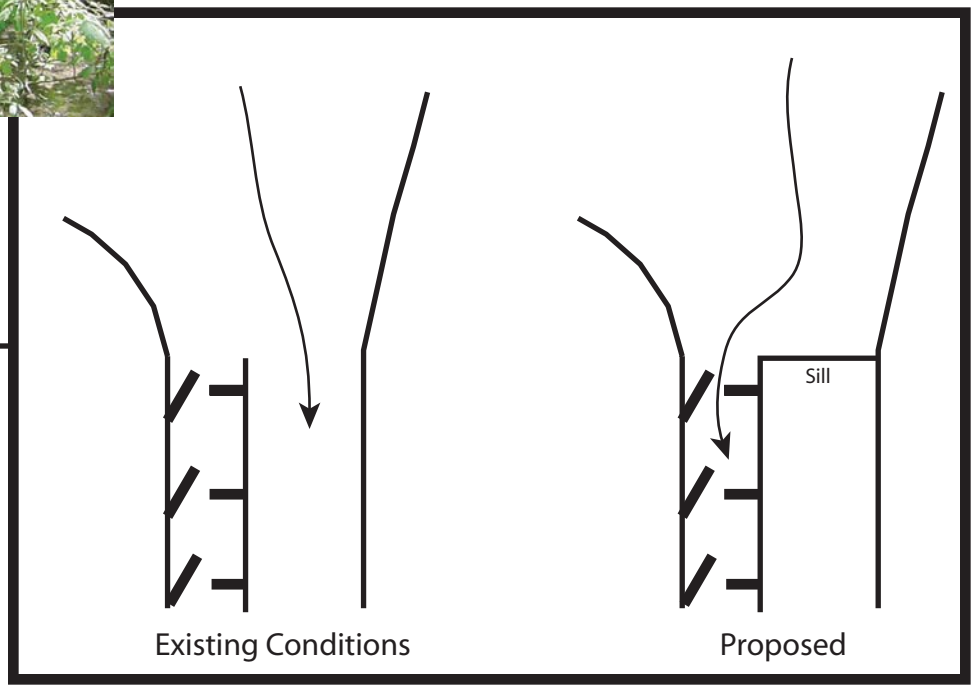
Conceptual improvements to culvert 2 include replacing last baffle with a wier.



Extend Fish Baffles: The existing concrete baffle section is 186' long, covering the entire length of culvert 1. There is a 15' concrete apron at the end of the baffles where shallow sheet flow occurs at low stream flows. The baffle section should be extended to the end of the concrete apron. See Figure # for channel treatment downstream of the apron.

Replace Sill: The existing baffle section in culvert 1 is missing a sill at the inlet causing low flows to avoid the baffles. The remnant metal fasteners suggest that the previous sill has been destroyed or removed. A new wood or concrete sill should be fitted at the culvert entrance to direct low flows through the baffles.



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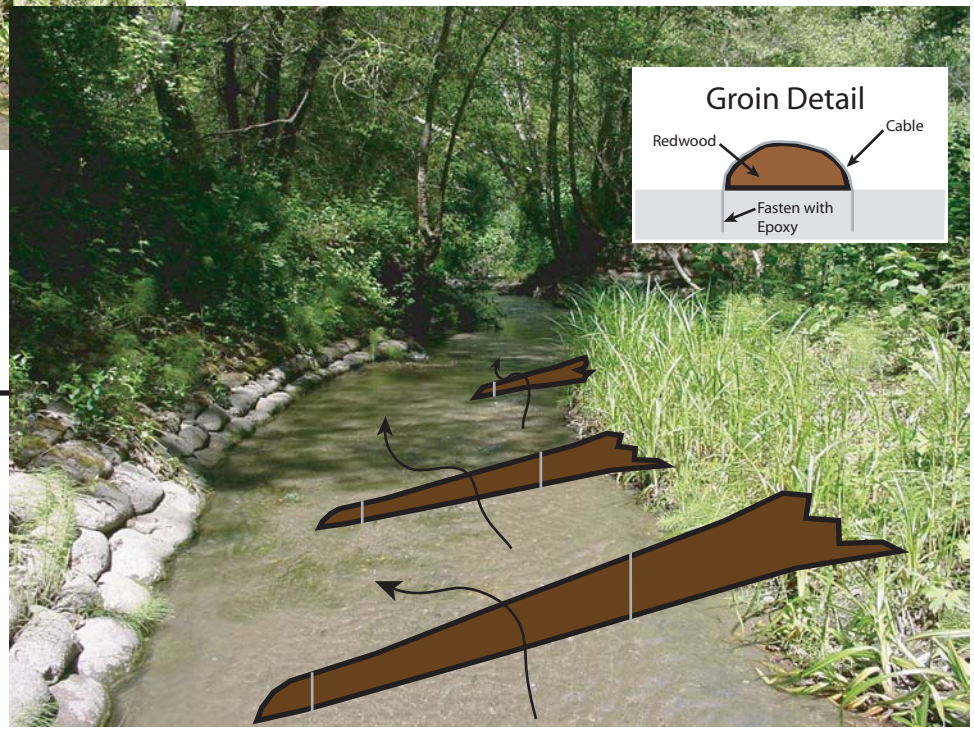
Conceptual improvements for Culvert 1 include extending the concrete baffles and replacing the sill at the culvert inlet.

Existing Conditions: Channel downstream of culvert 1 is lined with concrete along the channel bottom and left bank. The channel is very flat, creating shallow sheetflow at low flow conditions. This section of channel continues downstream from the culvert apron for approximately 120' before ending with a 2' drop into a pool.



Proposed Groins: Redwood logs (18-24" diameter) cut in half to lay flush with the channel bottom. Logs will be fastened with cable epoxyed into the concrete channel bottom and keyed into existing bank (see Groin Detail). These structures will promote point bar development and focus flow to the left side of the channel.

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Conceptual improvements to the channel downstream of culvert 1 include groin placement along the right bank.

Valencia Creek Exceedance Probabilities based on drainage area reduction relationship between Aptos Gage (ID#11159690) and Valencia Creek.

Percentile	Exceedance Probability	Flow (cfs) October	November	December	January	February	March	April	May	June	July	August	September	Annual
5	95	0.6	0.6	0.8	0.8	1.0	1.2	0.9	0.8	0.5	0.5	0.4	0.5	0.6
10	90	0.6	0.6	0.8	1.0	1.3	1.4	1.2	0.9	0.7	0.6	0.5	0.5	0.8
15	85	0.7	0.8	0.9	1.3	1.6	1.7	1.5	1.0	0.8	0.7	0.6	0.7	0.9
20	80	0.7	0.9	1.1	1.5	1.9	2.1	2.1	1.1	1.0	0.8	0.9	0.7	1.0
25	75	0.8	1.0	1.2	1.8	2.4	3.4	2.5	1.3	1.0	0.9	0.9	0.8	1.1
30	70	0.8	1.0	1.2	1.9	2.9	4.5	3.5	1.7	1.3	1.1	1.0	0.8	1.2
35	65	0.9	1.2	1.3	2.1	4.1	5.0	4.1	2.1	1.5	1.2	1.0	0.9	1.4
40	60	0.9	1.3	1.5	2.4	4.9	5.9	4.5	2.5	1.5	1.3	1.1	1.0	1.6
45	55	0.9	1.5	2.1	2.8	5.4	7.4	5.4	3.0	1.9	1.3	1.1	1.0	1.8
50	50	0.9	1.7	2.4	3.6	5.9	9.8	5.8	3.4	2.3	1.5	1.1	1.1	2.1
55	45	1.0	1.9	2.5	5.6	6.8	11.6	6.6	3.6	2.5	1.7	1.2	1.1	2.4
60	40	1.2	2.1	2.7	7.2	7.9	13.4	7.4	3.7	2.5	1.9	1.5	1.2	2.8
65	35	1.4	2.2	3.3	8.9	9.8	16.1	8.9	4.4	2.9	2.1	1.7	1.4	3.5
70	30	1.6	2.6	3.9	10.7	14.3	19.6	11.6	4.7	3.1	2.2	1.9	1.5	4.2
75	25	1.7	3.3	4.8	14.3	19.8	21.4	12.5	5.3	3.5	2.5	2.0	1.6	5.2
80	20	1.9	4.3	6.0	18.7	27.7	26.2	15.2	6.3	3.7	3.0	2.3	1.8	7.0
85	15	2.1	5.7	8.7	26.8	39.0	34.8	18.0	7.4	4.4	3.3	2.4	2.0	9.8
90	10	2.6	11.7	12.5	40.6	62.9	54.9	24.1	8.9	4.7	3.8	2.7	2.1	16.7
95	5	3.1	25.9	26.5	69.3	129.6	105.9	41.1	13.4	7.2	4.9	3.8	2.9	33.0
99	1	5.6	71.6	95.2	266.5	272.1	190.1	155.3	28.8	9.8	6.4	4.3	3.7	146.9
100	0	9.8	145.4	232.8	1489.6	677.9	428.2	454.9	75.8	10.7	49.1	4.5	5.7	1489.6

Denotes Low Fish Passage Design Flow Requirements

Denotes High Fish Passage Design Flow Requirements

Denotes probability of flows when fish passage is possible through the culvert baffle system based on DFG velocity and depth criteria

Fish passage through the ladder/culvert system is limited by the culvert condition rather than the ladder. Therefore, hydraulics were calculated for the culvert using DFG fish passage criteria. Based on the results of the hydraulic calculations, fish passage will occur at flows ranging from 1.1 to 53 cfs. allowing fish to pass through the ladder and culvert at 70% of annual flow conditions.

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Matt Wel
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ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COSTS

(NOT TO BE USED FOR BIDDING PURPOSES)

VALENCIA CREEK FISH PASSAGE

ITEM NO.	ITEM	UNIT OF MEASURE	ESTIMATED QUANTITY	UNIT PRICE	ITEM TOTAL
1	GEOTECHNICAL INVESTIGATION	LS	1	4000	$4,000
2	SILT FENCES AND EROSION CONTROL	LF	60	10	$600
3	MOBILIZATION / TEMPORARY ACCESS	LS	1	6000	$6,000
4	FISH REMOVAL	LS	1	3500	$3,500
5	STREAM DIVERSION	LS	1	3000	$3,000
6	CLEAR AND GRUB AREAS TO BE GRADED	LS	1	300	$300
7	REMOVE CONCRETE CLUVERT BAFFLES AND WALL	LF	170	30	$5,100
8	INSTALL NEW WASHINGTON BAFFLES AND WALL	LF	170	40	$6,800
9	ROCK ANCHORS	EA	3	1500	$4,500
10	CONCRETE PIERS	LF	192	175	$33,600
11	FORMWORK	SF	1320	9	$11,880
12	STEEL	TON	2.09	1500	$3,134
13	CONCRETE	CY	30	160	$4,800
14	WEIR BAFFLES	EA	750	5	$3,750
15	EXTEND EXISING CMP	LF	45	50	$2,250
				SUBTOTAL	**$93,214**
				CONTINGENCIES 10.00%	**$9,321**
				TOTAL	**$102,535**